

METHOD AND APPARATUS FOR ESTIMATING PHYSIOLOGICAL PARAMETERS USING MODEL-BASED ADAPTIVE FILTERING

ABSTRACT OF THE DISCLOSURE

5 A method and apparatus for reducing the effects of noise on a system for
measuring physiological parameters, such as, for example, a pulse oximeter. The
method and apparatus of the invention take into account the physical limitations on
various physiological parameters being monitored when weighting and averaging a series
of measurements. Varying weights are assigned different measurements, measurements
10 are rejected, and the averaging period is adjusted according to the reliability of the
measurements. Similarly, calculated values derived from analyzing the measurements
are also assigned varying weights and averaged over adjustable periods. More
specifically, a general class of filters such as, for example, Kalman filters, is employed
in processing the measurements and calculated values. The filters use mathematical
15 models which describe how the physiological parameters change in time, and how these
parameters relate to measurement in a noisy environment. The filters adaptively modify
a set of averaging weights to optimally estimate the physiological parameters.